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APPLICANT : TONEN CORP;

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INT.CL. : B01J 20/20 B01J 20/28 B01L 11/00 C01B 31/02 G01N 30/48

TITLE : PACKING MATERIAL FOR CHROMATOGRAPHY

ABSTRACT : PURPOSE: To obtain a packing material having good separation performance and excellent physical, chemical and biological stability by using porous carbon fine particles which are substantially spheres with a specified particle size and have coated surfaces.

CONSTITUTION: The porous carbon fine particles as the supporting body of the packing material for chromatography consist of substantial spheres with sphericity of  $\leq 1/2$  of the max. diameter, preferably  $\leq 1/4$ , and more preferably  $\leq 1/8$ . The average particle size of the porous carbon fine particles is  $0.5\text{-}100\mu\text{m}$  and preferably  $1\text{-}30\mu\text{m}$ . The surface of the porous carbon fine particle is modified with a coating material such as protein A, polyethylene glycol and the like. The obtd. packing material for chromatography has high mechanical strength and durability against high temp. and has excellent chemical stability and biological stability and good separation performance.

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# XP-002192133

AN - 1990-272346 [36]

AP - JP19890012256 19890120

CPY - OSAG

DC - J04 S03

DR - 1512-U 1669-U 1724-U

FS - CPI;EPI

IC - B01J20/20 ; G01N30/48

MC - J01-D01A J04-B01C

- S03-E09C5

PA - (OSAG ) OSAKA GAS CO LTD

PN - JP2193066 A 19900730 DW199036 000pp

PR - JP19890012256 19890120

XA - C1990-117901

XIC - B01J-020/20 ; G01N-030/48

XP - N1990-210593

AB - J02193066 Filler is an activated carbon with fine pores and (i) it is optically anisotropic, (ii) no less than 90% of the whole comprises particles of max. dia. 80 microns, and (iii) no less than 85% of the total pore vol. is constituted by micropores of max. dia. 20

Angstroms. Pref. non-polar gp. or polar functional gp. are introduced in granular activated carbon, pref. activated mesocarbon microbeads.

- ADVANTAGE - The specific surface area and pore vol. are large, exhibiting a high performance in sepn., even without pretreatment.

The mechanical strengths are high and resistance to heat, chemicals, swelling and shrinkage are excellent. The spherical particles are easy to fit in a column.

- In an example, mesocarbon microbeads activated with KOH having a specific surface area of 2000 m<sup>2</sup>/g were treated with conc. HNO<sub>3</sub> at 60 deg.C for 30 mins. to introduce carboxyl gp.. Then octadecyl gp. was introduced. (6pp Dwg.No.0/4)in

IW - COLUMN FILL LIQUID CHROMATOGRAPHY OPTICAL ANISOTROPE ACTIVATE CARBON  
NON POLE POLE FUNCTION GROUP

IKW - COLUMN FILL LIQUID CHROMATOGRAPHY OPTICAL ANISOTROPE ACTIVATE CARBON  
NON POLE POLE FUNCTION GROUP

NC - 001

OPD - 1989-01-20

ORD - 1990-07-30

PAW - (OSAG ) OSAKA GAS CO LTD

Tl - Column filler for liq. chromatography - has optically anisotropic activated carbon with non-polar or polar functional gps.

**XP-002192134**

**AN - 1983-37697K [16]**

**AP - JP19810139486 19810904**

**CPY - TAKA-I**

**DC - J04**

**FS - CPI**

**IC - B01D15/08 ; B01J20/26 ; C01B31/00 ; G01N30/48 ; G01N31/08**

**MC - J01-D01A J04-B01C**

**PA - (TAKA-I) TAKAHASHI H**

**PN - JP58041351 A 19830310 DW198316 005pp**

**- JP2050423B B 19901102 DW199048 000pp**

**PR - JP19810139486 19810904**

**XA - C1983-036856**

**XIC - B01D-015/08 ; B01J-020/26 ; C01B-031/00 ; G01N-030/48 ; G01N-031/08**

**XP - N1983-068231**

**AB - J58041351**, Filler is obtd. by alkylating the surface of optical anisotropic fine spherical particles of 1-10 microns in particle size (so-called meso-carbon microbeads) obtd. by heating pitches to 350-500 deg.C.

- The meso-carbon microbeads have large mechanical strength, heat resistance, chemical resistance, little expansion or contraction, large density and uniform surface, and the activity of the microbead filler is suitable as column filler for high performance liq. chromatography. Surface modification of the microbeads is pref. effected by first hydrogenating and then alkylating the surface of the beads by e.g. Friedel-Crafts reaction. Alkylating agent used is e.g. alkyl halogenide such as tetradecyl chloride, hexadecyl chloride, etc. Hydrogenation is carried out at ca. 1000 deg.C.

**IW - COLUMN FILL LIQUID CHROMATOGRAPHY COMPRISE SURFACE ALKYLATED OPTICAL ANISOTROPE FINE SPHERE MESO CARBON MICROBEADS**

**IKW - COLUMN FILL LIQUID CHROMATOGRAPHY COMPRISE SURFACE ALKYLATED OPTICAL ANISOTROPE FINE SPHERE MESO CARBON MICROBEADS**

**NC - 001**

**OPD - 1981-09-04**

**ORD - 1983-03-10**

**PAW - (TAKA-I) TAKAHASHI H**

**TI - Column filler for liq. chromatography - comprises surface-alkylated optically anisotropic fine spherical meso-carbon microbeads**